Addendum/Errata to the report titled "World Trade Center Indoor Environmental Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks (May, 2003)."

February, 2004

Copies of the "World Trade Center Indoor Environmental Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks (May, 2003) report and this "Addendum/Errata" sheet can be obtained on-line at www.epa.gov/WTC. Inquiries regarding the content of both of these documents should be directed to:

Mark A. Maddaloni Dr. P.H., DABT
U.S. Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10007-1866

Phone (212) 637-3590
E-mail maddaloni.mark@epa.gov

Section 3.4 Health Based Benchmarks - Expanded Discussion of PCM Equivalence

Asbestos clearance criteria was based on long (i.e., > 5 um) fiber counts. The use of a minimum fiber length of 5 um for carcinogenic activity represents current scientific consensus and is documented in both NIOSH methods 7400 & 7402 and EPA's Integrated Risk Information System (IRIS) toxicity data base.

The footnote to Table 1 in the report titled "World Trade Center Indoor Environmental Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks" documents this minimum length requirement along with a minimum length-to-width aspect ratio of 3:1 as prescribed in the NIOSH asbestos analytical methods 7400 & 7402. This counting method applies to phase contrast microscopy (PCM) analysis.

The asbestos counting rules employed for the WTC Indoor Clean-up Program was designed to record phase contrast microscopy equivalent (PCMe) fibers. This analytical method utilized transmission electron microscopy (TEM) and followed AHERA (Asbestos Hazard Emergency Response Act) counting rules. Fibers > 5 um were distinguished from total (i.e., >0.5 um) fiber counts. AHERA also stipulates a minimum 5:1 aspect ratio. Modification was made to AHERA (by obtaining larger samples volumes) in order to achieve the lower detection limits necessitated by use of risk-based clearance criteria.

NIOSH method 7402 is an alternative approach for estimating PCMe fibers by TEM analysis. The method counting rules differs slightly from the above approach in the it stipulates a minimum aspect ratio of 3:1 and a minimum fiber width of 0.25 um. The minimum fiber width reflects the optical resolution of PCM. Compared to NIOSH method 7402, the PCMe counts recorded for the WTC Indoor Clean-up Program may be marginally higher or lower. Extremely thin fibers (width < 0.25 um) were recorded but would have been excluded using NIOSH 7402 counting rules. The actual magnitude of this over count (relative to NIOSH 7402) is unknown but likely to be small. Conversely, asbestos fibers with an aspect ratio between 3:1 and 5:1 were not counted but would have been recorded using NIOSH 7402 counting rules. Similarly, the actual magnitude of this undercount is unknown but likely to be small - especially since the vast majority of identified asbestos fibers were chrysotile (which typically has a relatively high aspect ratio).

Appendix A: Deriving Health-Based Screening Values for Air and Dust Exposure Pathways

The screening values for settled and bulk dust employed a 30 year exposure duration to reflect an upper-bound estimate of time in residence, as per the recommendations in the Risk Assessment Guidance for Superfund (RAGS, 1989). (Screening values for asbestos in settled and bulk dust were not developed due to the highly uncertain relationship between settled and airborne asbestos.) Where applicable, the health-based benchmarks for the contaminants of potential concern listed in Table 1 of

the report also reflect a 30 year exposure duration. However, an oversight occurred in the screening values for inhalation carcinogens (e.g., asbestos). Rather than using the same 30 exposure duration employed for the dust pathway, the screening value employed the inhalation unit risk (IUR) which is based on lifetime (i.e., 70 yr) exposure duration. Consequently, the air screening value for asbestos listed in Appendix A (Table A-1) is 0.0004 f/cc (reflecting a 70 year exposure duration), while the health-based benchmark for asbestos listed in Section 3.4 (Table 1) is 0.0009 f/cc (reflecting a 30 year exposure duration).

Appendix D: Assessing Exposures to Indoor Air and Residues on Indoor Surfaces

The paradigm for assessing exposure from residues on indoor surfaces captures mouthing activity through an input parameter then assigns the number of hand-to-mouth contacts per hour as a function of age. The following mouthing frequency is listed in Appendix D (P. D-5): 1 to 6 yr - 9.5 times/hr; 7 to 12 yr - 5 times /hr; 8 to 18 yr - 2 times/hr; and, 19 to 31 yr - 1 time/hr. As listed in the report, two age groups (7 to 12 and 8 to 18) overlap. The actual breakdown by age is correctly listed in the table below under the column "COPC Spreadsheet." In addition, Appendix D lists mouthing activity for adults (19 to 31 yr) as 1 time/hr, when in reality the spreadsheet (and therefore the calculations used to develop heath-based benchmarks for indoor surfaces) employed an adult (19 to 31 yr) mouthing rate of 2 times/hr. The impact of using two rather than one mouthing events per hour for adults has a negligible impact on the health-based benchmark and what little effect it has is biased toward a more stringent value.

Ages (yr)	**COPC Report**	**COPC Spreadsheet**
1 - 6	9.5	9.5
7 - 12	5	5
8 - 18	2	2 (age 13 -18)
19 - 31	1	2